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HOW TO Identify **LEAF RUST** of Poplar and Larch

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North Central Forest Experiment Station
U.S. Department of Agriculture
St. Paul, Minnesota



How to Identify Leaf Rust of Poplar and Larch

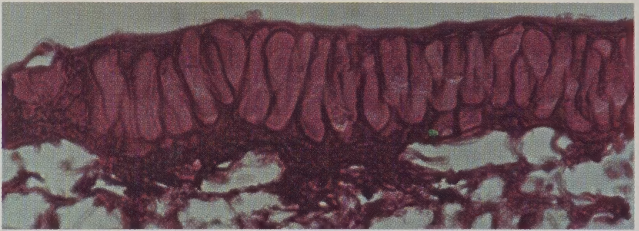
Leaf rust of poplar and larch is a disease caused by the fungus, *Melampsora medusae* Thum, and can be found on most poplar species in eastern and central North America, and on eastern larch (tamarack) and some introduced larches. The disease is most serious on hybrid poplars; it does little damage to larch.

The leaf rust fungus overwinters as a dormant spore (teliospore) on fallen poplar leaves.



Identification

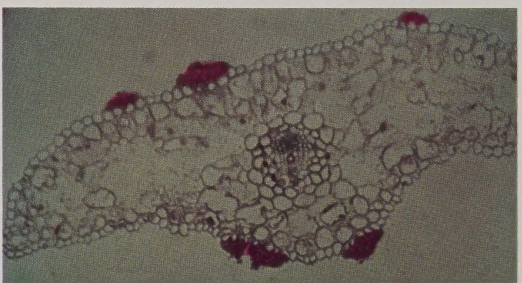
Look for: small brown to black crusty patches on fallen poplar leaves. Under a microscope, the spores appear as closely packed columns.



The teliospores germinate during wet weather in the spring, about the time larch needles first appear, and produce small spores (basidiospores) that are carried by the wind and infect the larch needles.

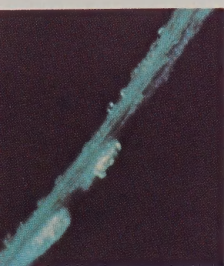


Look for: yellowish larch needles that appear to have minute droplets on the upper side during spring. In cross section, the droplets are small spore-producing structures (pycnia).



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Spores produced in the pycnia (pycniospores) do not infect plants, but fertilize other pycnia to form a spore-producing structure (aecium) in the lower surface of larch needles.

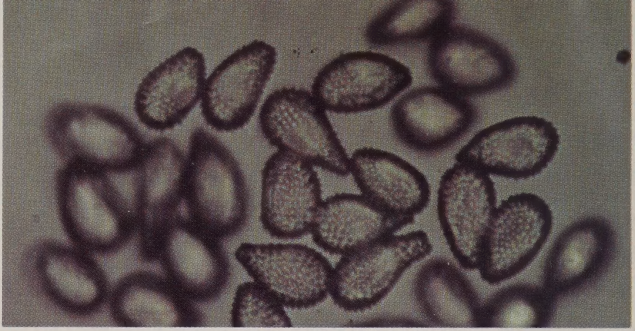


Look for: yellowish-orange pustules on larch needles 1 to 2 weeks after pycnia appear.

Spores from the aecium (aeciospores) are carried by wind to poplar leaves, where pustules (uredia) are produced.

Look for: yellow to orange spots on poplar leaves 1 to 2 weeks after aecia are found on larch needles.





Uredospores are carried by wind to other poplar leaves that become infected and produce more uredial pustules. In this way, poplars outside the range of larch can become infected. Such reinfection continues throughout the growing season and can produce local epidemics of the disease.

In fall, the teliospore stage is formed on infected poplar leaves, which drop from the tree to complete the disease cycle.

A second poplar leaf rust, *Melampsora abietis-canadensis*, infects poplars and eastern hemlock. Its life cycle is similar to the poplar-larch leaf rust, and its spore-producing structures are identical.

Damage caused by the poplar leaf rust

Little damage to larch occurs because of *Melampsora* leaf rust infection. Infection of poplars, especially early in the growing season, can cause growth losses of more than 20 percent. Heavy infection causes leaf drop early in the growing season, making infected young trees generally more susceptible to winter killing and to other diseases.

Control

- No fungicides are registered for use on poplars to control leaf rust.
- In some areas clones of poplar species and hybrids resistant to rust are available. If possible, plant only resistant clones. Check with your State Forester to determine the availability of resistant stock in your area. If resistant clones are not available locally, select cuttings from trees that appear resistant or plant only a few cuttings of the clones in question and watch for heavy rust infection. If little or no rust occurs, clones may be used for plantations.
- Do not plant poplar species adjacent to larch or hemlock trees.
- Wide spacing (1.5 meters or more) in plantations helps reduce rust severity of moderately susceptible clones but will not protect susceptible clones.



Technical References:

Widin, Katharine D., and Arthur L. Schipper, Jr. 1976. Epidemiology and impact of *Melampsora medusae* leaf rust on hybrid poplars. p. 63-74. *In* Intensive Plantation Culture — Five Year's Research. U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. NC-21, 117 p. North Cent. For. Exp. Stn., St. Paul, Minnesota.

Schipper, Arthur L., Jr. 1976. Poplar plantation density influences foliage diseases. p. 81-84. *In* Intensive Plantation Culture — Five Year's Research. U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. NC-21, 117 p. North Cent. For. Exp. Stn., St. Paul, Minnesota.

For further information, contact your nearest US Forest Service State & Private Forestry office or State Forester.

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